SECTION C Descriptions and Specifications

C – STATEMENT OF WORK

Commercial Depot Level Overhaul of US Navy LM2500 Turbine Mid Frame (TMF) removed from a decommissioned US Navy LM2500 gas generator.

C.1 Scope

This specification identifies the requirements for commercial depot level overhaul of one (1) US Navy LM2500 TMF, national stock number (NSN) 2835-01-077-5495 (part number (PN) L21794G03).

C.2 Applicable Documents

C.2.1 General

While every effort has been made to ensure the completeness of this list, document users are cautioned that they shall meet all specified requirements cited in Sections C.3 and C.4 of this specification, in addition to the specifications listed in the documents listed in Section C.2.2.

C.2.2 Government Documents

US Navy LM2500 Technical Manuals:

Organizational Level:
- S9234-AD-MMO-070/LM2500 latest revision
- S9234-AD-MMO-080/LM2500 latest revision
- S9234-AD-MMO-090/LM2500 latest revision

Depot Level Maintenance:
- S9234-AB-MMD-010/LM2500 latest revision
- S9234-AB-MMD-020/LM2500 latest revision
- S9234-AB-MMD-030/LM2500 latest revision
- S9234-AB-MMD-040/LM2500 latest revision
- S9234-AB-MMD-050/LM2500 latest revision
- S9234-AB-MMD-060/LM2500 latest revision

If requested, the US Navy LM2500 technical manuals will be provided after contract award to the successful Contractor. Application for copies of US Navy LM2500 technical manuals shall be addressed to Naval Surface Warfare Center (NSWC) Code 9333. The Contractor must request permission from NSWC Code 9333 to reproduce the manuals. Any US Navy manuals issued, and all copies made, and all printouts generated will remain the property of the US Navy.

C.2.3 Commercial Documents

If, after contract award, the Contractor proposes to use commercial General Electric (GE) repair procedures to complete the TMF overhaul, the Contractor must request approval from NSWC Code 9333 in writing prior to commencing repairs.

C.2.4 Order of Precedence

In the event of a conflict between the text of this document and the references cited herein, the US Navy LM2500 technical manuals listed in Section C.2.2 of this document take precedence. These manuals are as follows: Organizational Level Maintenance S9234-AD-MMO-070/LM2500 through S9234-AD-MMO-090/LM2500 latest

revision and Depot Level Maintenance S9234-AB-MMD-010/LM2500 through S9234-AB-MMD-060/LM2500 latest revision.

C.3 Requirements

C.3.1 General

The Contractor shall have prior experience with the overhaul of the GE LM2500 TMF for industrial or marine customers.

The Contractor shall furnish services in accordance with any written technical instructions. No verbal instructions will be accepted to the specifications set forth herein.

The Contractor shall overhaul, modify, incorporate mandatory updates, maintain standard configuration integrity, assemble, test, preserve, package, document, mark and prepare for shipment the LM2500 TMF in accordance with this specification.

All overhaul work performed under this specification shall be in accordance with the current US Navy LM2500 depot level technical manuals, S9234-AB-MMD-010 through S9234-AB-MMD-060 latest revision. Any and all deviations from these technical manuals must be approved in writing by the cognizant technical representative at NSWC prior to implementation.

All overhaul work performed under this specification shall be for the TMF to be modified to standard configuration, overhauled and delivered Ready For Issue (RFI) to the fleet. All parts shall be cleaned in accordance with procedures outlined in US Navy LM2500 depot level technical manual S9234-AB-MMD-010/LM2500 Chapter 3 or US Navy approved equivalent standard commercial procedures.

In addition to NSN and PN markings contained herein, overhauled units shall be marked in accordance with standard commercial practice with the contract number and date of overhaul.

C.3.2 Tooling

The Contractor shall possess all supplies and materials necessary to accomplish the overhaul of US Navy LM2500 TMF assembly. At the time of proposal submission, the contractor shall possess a minimum of 90% of the total number, and 95% of the total dollar value, of all required tooling and machinery necessary to perform an overhaul of an LM2500 TMF. The US Navy shall not provide nor be responsible for any special support equipment, tooling, or machinery used for the overhaul of US Navy LM2500 TMF. A list of Special Support Equipment and tooling required to perform an overhaul of an LM2500 TMF is contained in US Navy depot level technical manual S9234-AB-MMD-010/LM2500 Chapter 2. This list outlines the minimum required equipment needed to perform an overhaul of an LM2500 TMF. Contractor's may propose to use LM2500 TMF special support equipment, tooling, and associated machinery in excess of what is required in US Navy technical manual S9234-AB-MMD-010/LM2500 Chapter 2, that enhances the Contractor's ability to perform an LM2500 TMF overhaul.

C.3.3 Material

The Contractor shall supply and only use US Navy approved parts in the overhaul of US Navy LM2500 TMF. All approved parts for use in US Navy LM2500 TMF are listed in the US Navy LM2500 Illustrated Parts Breakdown S9234-AD-MMO-070/LM2500 through S9234-AD-MMO-090/LM2500 latest revision. The use of aftermarket parts is not permitted.

All US Navy material shall be stored indoors in a separate secured area. The Contractor shall be responsible for the security of any US Navy assets while the assets are at the Contractor's facility until the time that the TMF is delivered to a US Navy facility.

All material that scraps out during the TMF overhaul is property of the US Navy and is required to be shipped back to the US Navy when the overhaul is complete.

C.3.3 US Navy Furnished TMF Overhaul Upgrade Kits

The US Navy will provide the Contractor with selected US Navy LM2500 TMF upgrade kits as listed in Table 1. Gas Turbine Bulletin (GTB) - 24R1 entitled Inspection/Installation of TMF Anti-Rotation Pins is to be incorporated into the TMF overhaul. GTB 24R1 installs anti-rotation pins in the TMF to prevent a clocked liner from contacting and severing the gas generator thermocouples. The US Navy will supply the anti-rotation pins to the Contractor at no cost to the Contractor.

US Navy Gas Turbine Change (GTC) 89 entitled Coast Metal 64 Hardcoat TMF for Wear Protection is also required to be incorporated into the TMF overhaul however the Contractor is responsible for providing the material.

GTB/GTC	Issue Date	Subject	Kit Part Number
GTB 24R1	4/10/2000	Inspection/Installation of TMF Anti-Rotation Pins	135042
GTC 89	8/10/1994	Coast Metal 64 Hardcoat TMF For Wear Protection	To be provided by Contractor

Table 1: LM2500 TMF Overhaul Upgrade Kits

C.3.4 LM2500 TMF Work Scope

The Contractor shall process the TMF per procedures outlined in the US Navy LM2500 depot level technical manuals. In addition, the Contractor shall perform the following:

a. Replace No. 5R bearing, PN 9081M69P01 per Figure 8-16 of US Navy LM2500 depot level technical manual, with new.
b. Replace No. 6R bearing, PN 9658M53P02 per Figure 8-16 of US Navy LM2500 depot level technical manual, with new.
c. Replace TMF oil tube, PN 9084M64G02 per Figure 8-81 of US Navy LM2500 depot level technical manual, with new.
d. Replace TMF retainer rings, PN 9051M13G01 per Figure 8-82 of US Navy LM2500 depot level technical manual, with new.
e. Replace TMF Low Pressure Turbine (LPT) nozzle support, PN 9064M27G02 per Figure 8-78 of US Navy LM2500 depot level technical manual, with new.
f. Comply with GTB 24R1.
g. Comply with GTC 89.
h. Replace broken lockwire tabs on TMF outer case.
i. Weld build-up forward and aft outer rings on TMF liner. Patch weld deflector holes.
j. Restore dimensional requirements on TMF hub.
k. Weld build-up anti-rotation pin slots as required.
l. Repair TMF outer scavenge tube ending and flange.
m. Repair TMF inner scavenge tube ending.
n. Repair TMF outer vent tube ending.
o. Repair TMF inner vent tube insulation blanket.
p. Repair TMF LPT stage 1 nozzles.

Any conditions found that exceed the technical manual service limits require repair or replacement of component in accordance with the US Navy LM2500 depot level technical manuals.

US Navy LM2500 TMF shall have the mandatory Gas Turbine Technical Directives, GTB 24R1 and GTC 89, incorporated during the overhaul. NSWC Code 9333 will provide the Technical Directive upgrade kits to the Contractor to incorporate these Technical Directive at no cost to the Contractor, with the exception being GTC 89 for which the Contractor will have to provide. To view/download individual Technical Directives, the Contractor may visit the US Navy Marine Gas Turbine website at www.navygasturbines.org.

C.3.5 Technical Approval

Deviations from the latest revisions of US Navy LM2500 depot level technical manuals, listed in Section C.2.2 of this document, such as waivers, engineering change proposals, material substitutions, engineering directives or alternate overhaul methods, not specifically stated in these manuals shall only be permitted after processing deviations and obtaining written approval from NSWC Code 9333. Documentation for requesting such deviations to the US Navy technical manuals shall be an email sent to NSWC Code 9333 followed by a letter on company letterhead.

All processes, procedures, inspection criteria, and components used in the overhaul of US Navy LM2500 TMF shall be approved by NSWC Code 9333 for use or implementation in the TMF overhaul. Approved procedures and components are listed in the US Navy LM2500 technical manuals, outlined in Section C.2.2 of this document. The US Navy upon written request will evaluate additional procedures and components not listed in the aforementioned technical manuals on a case-by-case basis. Commercially equivalent procedures will be considered but are not approved for use without written authorization from NSWC Code 9333.

C.3.6 Delivery

The US Navy LM2500 TMF shall be overhauled, tested, documented and prepared for shipment within sixty (60) days after induction into repair cycle. The Contractor shall report work stoppage due to US Navy related delays to NSWC Code 9333 and to NSWC Code 3352, within three (3) working days. The repair cycle starts when the US Navy TMF arrives at the Contractor's facility, and is completed once the overhauled TMF is shipped to the US Navy.

C.3.7 TMF Overhaul Report

The Contractor shall compile a TMF overhaul report in the Contractor's format. This report shall be submitted to NSWC Code 9333 within sixty (60) days after completion of overhaul, in accordance with Contract Data Requirement (DD 1423 – A001). This report at a minimum shall contain:

a. Total overhaul work scope.
b. A list of all parts replaced and/or upgraded (e.g. part numbers, serial numbers and work performed).
c. Assembly records, a detailed step-by-step record of TMF assembly.
d. Test records from all testing performed.
e. List of all US Navy TMF upgrade kits incorporated.
f. All authorized deviations from US Navy LM2500 depot level technical manuals.
g. Method of shipment and location shipped to.

C.4 Testing Requirements

C.4.1 General

After overhaul and assembly, the Contractor shall pressure test the US Navy LM2500 TMF in accordance with the testing criteria cited in the latest revision of the appropriate US Navy LM2500 depot level technical manual. The TMF shall be tested to ensure that it will operate properly when installed on a gas generator.

Data from testing will be enclosed in the TMF overhaul report produced by the Contractor.

C.5 Quality Assurance

C.5.1 General

The Contractor shall provide a commercial warranty, which applies to the overhaul work performed under the contract, in accordance with Contract Data Requirement (DD 1423 – A002).

The Contractor shall maintain an internal component tracking system within their facility.

The Contractor shall minimize the use of subcontractors for overhaul.

C.6 Shipping and Packaging

The Contractor shall be responsible for all shipping required to overhaul the US Navy LM2500 TMF. The Contractor shall have the LM2500 TMF shipped to the Contractor's facility for overhaul. When the overhaul is complete the Contractor shall hermetically seal the TMF for preservation and ship the asset to NSWC Philadelphia.

All scrapped out material during the TMF overhaul shall also be packaged in accordance with standard commercial procedures and shipped to NSWC Philadelphia.